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PUBLIC REGULATION OF PRIVATE FORESTS

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In the past the policy of the Federal Government and of the states has been to dispose of the public lands as rapidly as possible. As a result the bulk of the best forest lands of the country—about three-fourths of the forest area—is in private ownership. These lands represent the most accessible and most productive forests, while those publicly owned are areas which were not valuable enough to attract investors before the policy of restricting their sale was introduced. It is probable that the amount of standing merchantable timber in the public forests is less than one-fifth of the total stumpage of the country. This is true in spite of the fact that there has been but relatively little lumbering in the public forests.

It has been established that the total annual increment of the forests of the country is less than one-third of the amount required by the people for use. The increment of the public forests is increasing; that of private forests is, on the whole, decreasing. While the forest area of the United States, if managed properly, is capable of producing a much larger amount of timber and other forest products than are now annually required for use, there will inevitably be a shortage if the forests continue to be handled as at present.

It is a well-established fact that the destruction of the forests at the headwaters of rivers affects the regularity of their flow. It is the testimony of many manufacturers that the rivers from which they secure power have of late years been much less regular than formerly. This increasing irregularity and the reduction of the minimum flow of the rivers have been very generally attributed to recent heavy lumbering and the destruction of forests by fires in the mountains. While the effect of lumbering on river flow has been popularly exaggerated, it is nevertheless a fact that the conservation of the forests at the sources of streams is of great importance. The mountain forests of the West are so largely owned by the

Government that a permanent forest cover at the headwaters of important western streams is in large measure insured. Nearly all of the mountain forests of the East are privately owned. For the most part these are not being managed at the present time in a conservative manner and there is danger of excessive clearings at the headwaters of our eastern rivers.

The facts explained above make it obvious that the public forests are not sufficient to guarantee a supply of timber and that our future needs will be met only by the practice of forestry on a large portion of what is now private land. It is true also that the water interests in the East require forest conservation in the mountain areas now privately controlled.

There are three possible methods of securing forest conservation of forest lands at present privately owned.

1. State regulation of private forests.
2. State ownership through purchase of large reserves.
3. Practice of forestry by private owners under state co-operation and assistance.

The country has just come to the realization that we are wasting our forest resources and that unless this waste is checked there will be serious consequences. A national movement of this character is necessarily accompanied by a misunderstanding of the exact problem on the part of many persons. It is, therefore, not unnatural that there is a tendency toward legislation designed to regulate private forests, in an endeavor to secure the establishment of forestry as quickly as possible, without a sufficiently careful consideration of the effects which the regulations proposed would be likely to have in actual practice.

The tendency toward the public regulation of the management of private lands has been manifested in bills offered in the legislatures of various states, in reports of state forest officers and in articles on forestry in magazines and other publications. For the most part these propositions have not been based on a thorough knowledge of forest conditions or of scientific forestry. In many instances, they are unsound in principle both from the standpoint of economics and of forestry. Many of the proposals are not capable of practical application and, if they were, would not accomplish the desired results. The efforts toward public regulation of private holdings are significant as showing a commendable realiza-

tion of the need of forestry. There is danger, however, that these efforts may be misdirected.

The proposals for public regulation of private forestry have one or more of the following purposes:

1. Protection from fire.
2. Regulation of cuttings in order to maintain forest production.
3. The protection and control of soil and water flow.

In former days there existed a spirit that the individual could do what he would with his own forest, even if his neighbor's property was endangered. Recently there has been a growing sense of individual responsibility, particularly in the matter of forest fires. Already many states have laws making the malicious firing of forests a misdemeanor and imposing penalties for the careless use of fire. In some states, burning a fallow and burning brush are forbidden in certain seasons, or a notification must be given to one's neighbor or to a specified town officer before such burning is undertaken. The principle of individual responsibility in starting forest fires is, therefore, well established in a number of states and will doubtless soon be in the laws of all states.

It is recognized by students of forest policy that fire protection cannot be entirely solved by the individual and that laws preventing the starting of fires by design or carelessness will not suffice. Adequate protection can be secured only through organization. There must be a definitely organized service to prevent fires and to extinguish those which may be started from one cause or another. Just as city property is protected through a fire department, so forests must be protected by an organized fire service, adapted to local conditions. The attitude of the private owner is that the state should assist him in the protection of his property which it taxes, that the taxation of forest lands should be based on sound principles, which is not the case at the present time anywhere in the country, and that this taxation should pay for the protection of forests and entitle him to such protection.

From the standpoint of the state it is reasonable to expect that in case a fire service to assist in the protection of private lands is established, the owners should leave their forests in as good condition as is practicable for the prevention of fires and for their extinguishment if started. It is a new principle, which has been proposed in

a number of instances, that the state may require private owners to dispose of the slashings after lumbering or in other ways put their forests into good condition for protection.

This principle has been definitely adopted by the advocates of forestry in the lake states. Official representatives of Michigan, Minnesota and Wisconsin recently met in a so-called lake states forestry conference at Madison, Wisconsin, and formulated a definite platform with reference to forest legislation. The portions of the platform, which immediately concern the present discussion, are as follows:

"WHEREAS, the experience of the fires of the last season has fully demonstrated that the leaving of debris over large areas of land in the form of 'slashes' seriously threatens the safety of all wild lands and forests, as well as farm settlements, and even towns; therefore, be it

"*Resolved*, that all persons cutting and exploiting timber in any part of the lake states here represented should be obliged to dispose of the debris in such manner that it shall not be a menace to the forests; that failure to do this should be punished by a fine commensurate with the extent of the operations and consequent possibility of damage; that the timber cut or standing, as well as the land, should be held to secure the payment of such fines imposed, and that full authority be given to the proper authorities to carry out and interpret the law providing for this disposal of debris or 'slashings.'

"WHEREAS, in the matter of forest fires this conference realizes that these forest fires in the lake states during any dry season really take on enormous proportions; that we are dealing, therefore, with great calamities affecting human life as well as millions of acres of land and many millions of dollars worth of property; from this it follows that any measures adopted should be adequate to the situation; that efficient preventative and protective measures are the only kind that will really pay, and that such protection in a single year can and will save enough property, such that the interest on the material wealth saved will easily maintain such service or protection; therefore, be it

"*Resolved*, that forest fires, being one of the greatest enemies of the state, and thus akin to riot and invasion, the executive power of the state should be employed to the utmost limit in emergencies in their suppression and control for the protection of the lives and property of the people."

These recommendations have been definitely formulated in a proposed bill now before the Minnesota legislature. The clause of special interest is as follows:

"SEC. 1787d. Any person or corporation who cuts or fells or causes to be cut or felled timber or wood for commercial purposes shall pile, and under

charge of a competent person or persons burn the slashings (by which is meant the branches, tops and refuse) at the time of cutting; provided, that when the cutting is done between the months of March and November, the slashings shall be piled at the time of cutting and be burned during the following winter."

The same principle is at the basis of a proposal which is to be presented to the New York legislature, requiring private owners to lop the tops after lumbering; that is, to cut off the branches in order to bring them in close contact with the ground, an operation which hastens their decay and thereby lessens the danger from fire.

It has been clearly demonstrated that in the pine forests of the lake states burning of the tops at the time of cutting constitutes the best measure for disposing of them. It has also been shown that unless this material is destroyed, it is practically impossible to guard against serious damage by fire. In the Adirondacks, on the other hand, the character of the forest is such that there are many small trees growing in mixture with the older ones, so that burning of brush would inevitably injure the small timber. Moreover, the forest is damper than a pine forest and it is not so necessary to burn the slash. If the limbs are scattered so as to come in contact with the ground, they absorb moisture so quickly that the measure is adequate to put the forest into condition for protection.

The principle at the basis of these propositions seems to the writer fundamentally sound. The objections which would naturally be brought against the proposals are:

1. That a specific measure like brush burning in a given region might not always be necessary or the best method of fire prevention.
2. That it would be exceedingly difficult to carry out such a law in practice.
3. That it would be an opening wedge for further legislation such as required construction of fire lines.

It is true that brush burning is not always the best method of preparing the forest for fire protection. Even in the pineries it may sometimes be better to lop the tops and scatter the brush. Within a pine region there are necessarily some types of forest in which brush burning would be as injurious to the trees left standing and as unnecessary as in the Adirondack Mountains. Moreover, in a few years with better fire protection than now there will be considerable reproduction coming up throughout the forest and different

conditions will prevail. These facts must be taken into consideration in preparing a law for a given region. There must be sufficient elasticity to permit the disposal of the brush in the way which would be best for the forest and practical for the owner.

There would necessarily be many difficulties in requiring private owners to dispose of brush after lumbering if they were not in sympathy with the provision. There would always be a certain number of individuals desirous of securing the privileges of the state fire protection, but who would be unwilling to comply with the provisions of the law. In the writer's judgment, it would be decidedly difficult to carry out and put into effect required disposal of brush unless it is distinctly to the interest of the land owners themselves, unless the methods are both practical and effective, and unless the majority of the owners themselves approve of the law and desire to see it carried out. If these conditions exist in any given region, such a law is applicable and the difficulties in putting it into effect would not be insuperable.

It would take some years to establish a thoroughly practical system of required disposal of brush. During the first few years of its application, there would probably be a good many fires, and some persons would undoubtedly attempt to introduce further regulations, in the belief that fire patrol and burning of brush are not sufficient for effective protection. In fact, certain individuals have already advocated that private individuals be required by law to construct fire lines. Required brush-burning will be successful only to the extent that it is practical. In the same way the construction of fire lines or any other measures will not be used until they are shown to be necessary and practical. In that event it will be entirely possible to bring them into practice.

In several states laws have been suggested which not only place certain restrictions on private owners for protection against fires, but also prescribe how the forests shall be cut. In most cases the proposed laws forbid the cutting of trees below a certain size.

The most comprehensive bill of this character so far presented is that now before the legislature of Maine. This provides for the establishment of all private forests as auxiliary state forests. An owner must secure a license before lumbering his land. It is unlawful to cut any pine or spruce trees less than ten inches in diameter except where necessary in clearing for roads, yards and similar pur-

poses. All trees must be cut by sawing and the stumps may not be over twelve inches high. The tops must be trimmed, and the brush piled and burned. Where such occur, at least three trees of pine and spruce capable of bearing seed must be left on each acre. If an owner wishes to use another system of management, he may do so upon the approval of the state forester. In return he receives protection from fire and exemption from taxes on all growing timber.

In a bill introduced into the Louisiana legislature last year, there is a provision that no private owner has a right to cut down any tree (except fruit or willow trees) less than twelve inches in diameter. It is further made unlawful to cut the trees in such a way as to injure young growth, and tops and brush must be removed from the neighborhood of young trees so as not to injure them. At various times laws have been proposed in New York forbidding private owners to cut their small timber. Usually the limitation of cut to a certain diameter is the method suggested. These proposals are based on the following assumptions:

1. The continuance of forests is necessary for the public welfare because of their indirect protective influences and the maintenance of a supply of wood, timber and other forests products.
2. The destruction of the mountain forests will result in direct injury through disturbance of the flow of the rivers. A reduction of productiveness through destructive management will result in an inadequate supply of timber and other products.
3. The state has a right to prevent a mishandling of its natural resources which would tend to impoverishment of the people.

The Supreme Court of Maine has rendered a decision¹ that the state has a constitutional right to require forest owners to handle their property in such a way as not to injure the public interests. The decision asserts that the state may regulate the lumbering on private lands in order to protect the streams and also in order to maintain the productiveness of the forests in the permanent interests of the owners themselves and of the general public. This decision, if sustained, opens the way for very extensive state regulation of private business, and already it has stimulated the production of a great variety of proposals of the character of the Maine and Louisiana bills already mentioned. In discussing the legal enforce-

¹March 10, 1908.

ment of the practice of forestry on private lands, it is necessary to keep separate the two purposes: First, to secure a future timber supply, and second, to prevent direct injury through disturbance of river flow and in other ways.

It has already been explained in the beginning of this paper that the future supply of timber depends in considerable part on the production of forests now in private ownership. The Maine decision is to the effect that the state has a right to compel owners to cut their timber in a certain way in order to contribute to the future yield of forest products. Whether the enforcement by law of certain methods of cutting is the best way to accomplish this result is an entirely different question. In the opinion of the writer such an attempt would be unwise, both from the standpoint of state policy and technical forestry. There is a very close analogy between the maintenance of the production of forest products and of agricultural products. Bad farming is certainly a disadvantage to the community at large. Yet we are not forcing the farmer by law to adopt certain measures of cultivation. It is regarded as a much wiser plan to bring about intelligent agriculture through education and other indirect means. It is far better to show farmers how good agriculture may be to their own advantage and to teach them how to practice it than to force it upon them, even if the first methods require a long time for accomplishment. In the same way forestry for timber production should be brought about through state co-operation and assistance and through education and not by legislation.

Lumbering, not accompanied by fire, usually does not result in devastation. Almost always there are some trees left standing which produce seed and gradually re-establish a forest. Sometimes the lumberman leaves the forest in a fair condition for regrowth. More often the productiveness of the forest is enormously reduced compared with that secured under intelligent practical forestry. Examples of the very destructive lumbering may be found in the South, where the mature pines are cut clear and most of the trees removed from areas of considerable size. It nearly always happens that groups of young trees or individual trees too defective for lumber, but still capable of seed production, are left standing in amounts sufficient to enable a gradual return of the forest. It may take fifty years to re-establish the new crop instead of ten years, and the crop

will be a much less valuable one than would result under forestry methods. Thus the average annual increment obtained by ordinary forestry might be 200 board feet and that under destructive lumbering twenty feet. Yet even under the worst methods of cutting some production is secured, provided fires are kept out. If one were to make a large enough investment the growth could be increased much over 200 feet, to a maximum which our studies have not yet determined. It is, therefore, not a question of preventing absolute destruction by the private owner because he does not destroy unless he uses fire. It is a question whether the owner shall maintain his forest production above some specified minimum amount.

The usual method proposed for regulating private forests is to prescribe certain specified rules for cutting to be applied to all types of forest in a given region. Forestry cannot be practiced by rule. A forest is not a uniform crop. It is enormously variable in composition, form, condition and productiveness. The measures necessary to keep up the productiveness must vary with every portion of the forest.

Just what should be done for the maintenance of production depends entirely on the character and condition of each forest, the market conditions, and the special desires of the owners. In many cases a general rule of cutting such as proposed in certain states would not have any better results from the productive standpoint than ordinary lumbering. The Louisiana proposal cited above is a case in point. It advocates the application of a rigid kind of selection system of cutting in yellow pine forests. One of the principal characteristics of the yellow pine forests of Louisiana is that they are composed of stands and groups of trees, each having about the same age. In a mature stand, therefore, the trees below twelve inches are about the same age as those above that limit. Such small trees are usually the poorest in the stand. They have grown very slowly, have been crowded by their neighbors, and their crowns are small and undeveloped. The cutting of a forest under the proposed restriction would leave a considerable number of undersized old trees which would in many cases be blown over and at the best would not grow rapidly after cutting, and would contribute very little to the production of seed. The law restricting the cutting to large trees would, therefore, not secure the results desired.

The bill introduced into the Maine legislature would result in

somewhat better silviculture than the Louisiana proposal. In Maine many forests are composed of trees of all ages mingled together. Such a forest is one in which the selection system of cuttings is applicable. A restriction of the diameter is a rough approach to the methods which a forester would use in some stands in Maine but a rigid rule of thumb would inevitably remove many trees which ought to be left, and leave a large number which ought to be removed for the benefit of the forest and which it would pay to cut. Moreover, there are in Maine some types of forest on which a selection cutting is entirely inapplicable and where its use would inevitably be followed by extensive windfall. The methods of silviculture applicable to Maine are in some cases to cut on a selection system and sometimes to cut clear. In a selection system the method of selecting the trees necessarily varies enormously. No rigid rules can be successfully applied.

The application of a law requiring certain measures of silviculture would be exceedingly difficult. An army of inspectors would be needed to enforce the rules. Great antagonism would be aroused against the law among many owners not in sympathy with it, and effective enforcement would often result in the virtual assumption by the state of the management of the property. It is exceedingly unlikely that the results of enforced silviculture would be any better than those which could be secured through indirect state action.

The experience of Europe is interesting in this connection. In the eighteenth century and the early part of the nineteenth century there were many laws in the different states regulating the cutting on private lands. These regulations concerned the rotation of the trees and the methods of cutting them. Some of them were very similar to measures now proposed in this country. It was found that such regulations could not be carried out in practice and in the recent revision of the laws they have been in large part dropped, with the exception of such as refer to the protection forests. Thus in Germany to-day, there are no restrictions whatever on private cutting on over seventy per cent. of the private forests except within the belt of protection forests.

The worst period of forest destruction has been passed. The Government has already a vast domain of national forests on which the best forestry is being introduced as rapidly as possible. The total area of public forests controlled by the Government will soon

be not less than 200 million acres. A policy of purchase of state forests has been established in eleven states and there is every prospect that this policy will be adopted in most of the other states in a short time. The purposes of the state forests are:

1. To protect critical watersheds.
2. To produce wood and timber especially of those grades which the private owner will be unlikely to supply.
3. To give a practical demonstration of forestry.

It is reasonable to expect that there will ultimately be state forests aggregating about twenty-five to fifty million acres. Thus there will probably be from two hundred and twenty-five to two hundred and fifty million acres of public forests in the not far distant future, constituting about forty per cent. of the present forest area of the country.

There is every prospect that a policy of state assistance and co-operation with private owners will soon be general. As soon as there is a sane system of taxation of timberlands, and adequate protection from fire, owners will begin to practice forestry more extensively than now. Private forestry will further be stimulated by education through the personal work of the state officers and by practical demonstration of the best methods of forestry in the state reserves. Private forestry will accompany the increase in value of woodlands. As the old timber becomes scarcer the value of growing trees will be better appreciated. Already investors are beginning to buy up second growth woodlands with a view to holding them for their future production. There is no reason why practically all the farm woodlots should not be handled as conservatively as is now the case with many of them in the eastern states where there are state foresters. These woodlots comprise approximately 200 million acres. Public regulation of cutting upon them is certainly unnecessary.

If one subtracts the areas likely to be publicly owned and the woodlots from the total forest area of the country, there remain about 125 to 150 million acres. The writer does not believe that with fire protection, reasonable taxation and state co-operation the owners of these forests will practice such a system of devastation as to warrant the public enforcement of rules of silviculture treatment.

One of the common purposes in proposing the public regulation of private forests is the protection of the sources of rivers. The

example of Europe may be cited, where critical areas in the mountains are designated as "Protection Forests." Certain regulations are promulgated for these forests, private as well as public, restricting their use. These regulations which differ in the different countries usually forbid permanent clearings, clear cutting over large areas, and sometimes over small areas, grazing, raking of leaves and any other operation which may result in erosion, landslides, disturbance of stream flow, etc. As a rule, the prescriptions are broad and general and there usually is no attempt to establish cutting rules. As much latitude is given the owner as is compatible with protection. Every assistance is given him by the state forests in applying the best methods of forestry, and often the state takes over entirely the management of certain private holdings within the protective belt.

The principle underlying the restriction of the private forests in a protection belt is that the state may prevent a private individual from so mishandling his property as to injure the property of others. The difficulty in carrying out these regulations is that it is usually impossible to prove that any single cutting does any damage. It is probable that isolated cuttings do not have any measurable influence on water flow. It is only in the case of extensive lumbering over large areas that injury can be shown. It would be necessary, therefore, to determine arbitrarily certain areas where it is believed that extensive deforestation would be detrimental to river flow or cause erosion, and designate these as Protection Forests as in Europe; then to regulate the cuttings upon the private holdings within this area, whether or not it could be shown conclusively that damage would be done by destructive lumbering on any given tract.

Granting that the state has a right to establish protective areas at the headwaters of rivers and to regulate private forests within them, the writer believes that it is a better policy for the state to purchase all those areas which must be kept under permanent forest cover for the public benefit. If there are interstate watersheds where a single state may not be expected to purchase because the protection would primarily be for the benefit of another state the Government should solve the problem by establishing national forests. In this way the burden of preserving the forests for the public benefit is placed upon the public, where it belongs, and not upon a single class of individuals.

In conclusion, it is the opinion of the writer that state regu-

lation of private forests should be confined to restricting the use of fire and to requiring a reasonable organization of the forests for protection, and should not be extended to governing the methods of cutting; that the protection of watersheds should be accomplished by the establishment of public forests; and that the problem of the future timber supply may be solved effectively by means of the public forests supplemented by forestry practiced on private lands under state encouragement and co-operation.